

Amendment To The Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (currently amended) Apparatus for detecting particles on a surface of a semiconductor wafer, said surface having repetitive patterns, the apparatus comprising:

(a) a laser for illuminating an area on said surface with a beam of polarized light,

(b) a first camera,

(c) a first imaging lens for collecting light scattered from said area, said first imaging lens forming a Fourier diffraction pattern of light scattered from said area illuminated at the back focal plane of said first imaging lens,

(d) a Fourier mask for blocking light in said Fourier diffraction pattern where the intensity is above a predetermined level indicative of background information and leaving in areas where the intensity is below said predetermined level indicative of particle information, the Fourier mask including a spatial light modulator (SLM) which is optically addressable and a polarization discriminator in the form of a polarizing beamsplitter, the polarizing beamsplitter being disposed optically between the first imaging lens and the SLM the SLM including a 100% reflective dielectric mirror and a photoconductive layer, the polarizing beamsplitter receiving light collected by said first imaging lens and splitting said light so collected into a transmitted beam and a reflected beam, the first camera being disposed along the path of the transmitted beam,

(e) a second camera disposed along the path of the reflected beams,

(f) a second imaging lens for imaging the Fourier diffraction pattern formed by the first imaging lens of light from the reflected beam in the back focal plane of the first imaging lens into the second camera, said second camera converting the image of the Fourier diffraction patterns into a stream of digital electrical signals,

(g) light from the polarizing beamsplitter in the transmitted beam striking the 100% reflective dielectric mirror which is disposed in the back focal plane of the first imaging lens.

(h) ~~(g)~~ a processor for processing the stream of digital electrical signals formed by the second camera,

(i) ~~(h)~~ a liquid crystal display (LCD) for converting the output of the processor into a video image, and

(j) ~~(i)~~ a third imaging lens for imaging the video image of the LCD onto the photoconductive layer in the SLM,

(k) ~~(j)~~ light reflected back from said 100% reflective dielectric mirror as modified by light striking the photoconductive layer from the LCD is reflected by said polarizing beamsplitter and imaged onto said first camera, said first camera recording the image of the area imaged by said first imaging lens using scattered light not blocked by said Fourier mask.

Claims 2-19 (canceled).

Claim 20 (currently amended) Apparatus for detecting particles on a surface of a semiconductor, said surface having repetitive patterns, the apparatus comprising:

(a) a laser for illuminating an area on said surface with a beam of polarized light,

(b) a first imaging lens for collecting light scattered from said area, said first imaging lens forming a Fourier diffraction pattern of light scattered from the area at the back focal plane of the first imaging lens,

(c) a beamsplitter disposed optically behind the first imaging lens for splitting the light collected by the first imaging lens into a transmitted beam and a reflected beam,

(d) a first camera disposed along the path of the transmitted beam at the image plane of the first imaging lens,

(e) a Fourier mask disposed between the beamsplitter and the first camera, the Fourier mask including an electrically addressable spatial light modulator (SLM) operating in a reflective mode and a crossed polarizer, said SLM being disposed optically behind said beamsplitter in the Fourier transform plane of light from the first imaging lens in the transmitted beam, said Fourier mask blocking off light in said diffraction pattern where the intensity is above a predetermined level indicative of background information and leaving reflecting light in areas back to said beamsplitter where the intensity is below said predetermined level indicative of particle information, said crossed polarizer being disposed optically between said SLM and said first camera,

(f) a second camera disposed along the back focal plane of the first imaging lens for converting an image of the diffraction pattern formed by the first imaging lens using light in the reflected beam from the beamsplitter into a stream of digital electrical signals,

(g) a processor for processing the stream of digital electrical signals formed by the second camera, and

(h) an SLM controller for applying the output of the processor into the SLM,

(i) light striking the SLM from the transmitted beam, reflected back from said SLM and then reflected by said beamsplitter and not blocked by said crossed polarizer is imaged onto said first camera, said first camera recording an image of the area illuminated by said first imaging lens and not blocked by said Fourier mask.

Claims 21 and 22 (canceled)